AMENDMENTS TO THE SPECIFICATION

Please substitute the paragraph beginning at page 1, line 7 and ending at page 2, line 4 to read as follows:

-- ~~Hitherto~~ Previously, various flow sensors have been used ~~to detect~~ for detecting the flow quantity of a fluid. For example, an ultrasonic vortex flow sensor ultrasonically detects ~~ultrasonically~~ a flow quantity change in a noncontact manner. ~~a~~ A Karman vortex ~~occurring~~ regularly occurs downstream from a vertex generation pole placed in a flow. The ultrasonic vortex flow sensor can ultrasonically detect a change in the Karman vortex, and can thereby ~~detecting~~ detect the flow quantity with a high accuracy ~~in~~ over a wide flow quantity range. (For example, refer to JP-A-4-77620 and JP-A-8-304142)

Such flow sensors include an integral-type flow sensor and a separate flow sensor. The integral-type flow sensor, which has a flow quantity detection part and a flow quantity display part in one piece, becomes ~~large~~ larger. On the other hand, the separate flow sensor is ~~made up of~~ provided in a detection section for detecting the flow quantity. ~~and a~~ A display section ~~for~~

~~displaying~~ displays the value of the detected flow quantity. Generally, in the separate flow sensor, the detection section does not have a display section and thus can be miniaturized.

However, ~~to install~~ by installing the detection section, the user cannot check whether or not the flow quantity exists and ~~cannot check~~ whether or not the flow sensor ~~operates~~ processes normally ~~either~~. --

Please substitute the paragraph beginning at page 2, line 14 and ending at page 3, line 21 to read as follows:

-- As shown in FIG. 14, a cylindrical element storage part 920 is provided on both sides of the outer peripheral surface of the through water pipe line 910, and a transmitter 911 and a receiver 912 are inserted into the element storage parts 920. Each element storage part 920 is closed by a press member 930 having a convex part 9a ~~at~~ in the ~~center~~ central portion. Accordingly, the convex parts 9a of the press members 930 press the transmitter 911 and the receiver 912 against the outer peripheral surface of the through water pipe line 910. A taking-out pipe 970 of a conductor KB of the transmitter 911 and the

receiver 912 of the through water pipe line 910 is provided in the direction crossing the element storage parts 920.

Thus, the press members 930 each having the convex part 9a ~~at the center~~ centrally press the transmitter 911 and the receiver 912 against the outer peripheral surface of the through water pipe line 910~~, so that~~ . In this case, the size of the detection section 900 of the flow sensor in the related art becomes ~~large~~ larger in the direction in which the transmitter 911 and the receiver 912 are aligned ~~and~~ . Also, the size ~~also~~ of the detection section 900 of the flow sensor becomes ~~large~~ larger in the direction crossing the direction in which the transmitter 911 and the receiver 912 are aligned. Since such a structure is housed in the casing 940, the detection section 900 is upsized as a whole. Recently, it has been desired to make ~~making slim~~ the detection section 900 ~~has been desired~~ smaller.

Summary of the Invention

It is an object of the invention to provide a flow sensor for enabling the user to easily check the detection state of the flow quantity ~~on~~ in a detection section.

It is another object of the invention to provide a flow sensor for enabling the user to easily check the detection state

of the flow quantity ~~on~~ in a detection section that can be miniaturized and made ~~slim~~ smaller. --

Please substitute the paragraph beginning at page 9, line 6 and ending at page 10, line 11 to read as follows:

-- Referring now to the accompanying drawings (FIGS. 1 to 12), ~~there are shown~~ flow sensors are shown according to first and second embodiments of the invention.

(First embodiment)

FIG. 1 is a schematic drawing to show the configuration of a flow sensor according to a first embodiment of the invention.

In FIG. 1, the flow sensor is ~~made up of~~ provided in a detection section (sensor head or sensor head section) 100 and a main unit section (sensor main unit section or sensor main section) 200. The detection section 100 is connected to the main unit section 200 by a cable. The main unit section 200 has a display section 230.

FIG. 2 is a block diagram to show the configuration of the flow sensor according to the first embodiment of the invention. As shown in FIG. 2, the flow sensor is ~~made up of~~ provided in the detection section 100 and the main unit section 200.

The detection section 100 includes a transmitter 111, a receiver 112, a high frequency signal oscillator 120, a high frequency signal amplifier 130, a phase comparator 140, a low frequency amplifier 150, a comparator 160, a frequency divider 170, a decoder 180, a signal level determination unit 190, and a flow indicator LU. This flow indicator LU includes light emission sections 81 to 84. The light emission section 81 ~~is made up of~~ has a red LED (light emitting diode) 81R and a green LED 81G. Each of the light emission sections 82 to 84 has a green LED. ~~The~~ For example, the transmitter 111 and the receiver 112 are implemented as ultrasonic devices~~, for example~~.

The main unit section 200 includes a frequency measurement device 210, a computing unit 220, a display section 230, a control output section 240, and an analog output section 250. ~~The~~ For example, the frequency measurement device 210 and the computing unit 220 are implemented as a CPU (central processing unit~~), for example~~. --

Please substitute the paragraph beginning at page 11, line 18 and ending at page 12, line 7 to read as follows:

-- The signal level determination unit 190 determines whether or not the level of the output signal of the high frequency signal amplifier 130 falls below a predetermined value. If the level of the output signal falls below the predetermined value, the signal level determination unit 190 turns on the red LED 81R of the light emission section 81 and prohibits the decoder 180 from turning on the green LED 81G of the light emission section 81 and the light emission sections 82 to 84 and further gives an alarm signal to the computing unit 220. Accordingly, the computing unit 220 can recognize that the reception level falls. If the through water pipe line 10 through which a fluid flows is not filled with a fluid or if a bubble exists in a fluid, the reception level of the receiver 112 falls and the accurate flow quantity value cannot be detected. In this case, the signal level determination unit 190 outputs an alarm signal. --

Please substitute the paragraph beginning at page 12, line 12 and ending at page 13, line 2 to read as follows:

-- If the given alarm signal is on (for example, high), the computing unit 220 causes the display section 230 to display an

alarm and performs processing with a digital filter. For example, if the alarm signal is on, the computing unit 220 causes the display section 230 to display the flow quantity value applied before the alarm signal is turned on as many times as the preset number of times ~~or~~ . The computing unit 220 also calculates moving average of the flow quantity values as many times as the preset number of times and causes the display section 230 to display the moving average. If the alarm signal is on, the control output section 240 turns on or off first output and second output using the flow quantity value applied before the alarm signal is turned on as many times as the preset number of times ~~or~~ . The control output section 240 also turns on or off first output and second output based on the moving average of the flow quantity values as many times as the preset number of times. Further, the analog output section 250 outputs an analog alarm signal. --

Please substitute the paragraph beginning at page 15, line 1 and ending at page 15, line 6 to read as follows:

-- In FIG. 4, the detection section 100 is ~~made up of~~ provided with casing members 21 and 22, the through water pipe

line 10, two circuit boards W, packing PK, and a plurality of screws 50. The through water pipe line 10 is provided so as to ~~pierce~~ pass through the cabinet 30 and is integral with the cabinet 30. The casing members 21 and 22 are combined into the casing 20 in FIG. 3. --

Please substitute the paragraph beginning at page 19, line 11 and ending at page 19, line 23 to read as follows:

-- A press member 32 is ~~made up of~~ provided with a pair of press parts 32a and 32b and a flat part 32c. The pair of press parts 32a and 32b is formed integrally with both ends of the flat part 32c angular U-shaped in cross section so as to be opposed to each other. The press part 32a is formed with a notch shaped like a letter U. The press parts 32a and 32b of the press member 32 are inserted between the transmitter 111 and the receiver 112 and the end faces 30a and 30b of the cabinet 30. Accordingly, the transmitter 111 and the receiver 112 are pressed against the outer peripheral surface of the through water pipe line 10 by the press parts 32a and 32b of the press member 32. Consequently, the transmitter 111 and the receiver 112 are fixed in the cabinet 30. --

Please substitute the paragraph beginning at page 23, line 22 and ending at page 24, line 2 to read as follows:

-- In FIG. 11, the detection section 500 is ~~made up of~~ provided with casing members 21, 22, and 23, the through water pipe line 10, two circuit boards W, packing PK, a plurality of screws 50, and a press member 32. The through water pipe line 10 is formed integrally with the casing member 22. The casing members 21, 22, and 23 are combined into the casing 20 in FIG. 10. --

Please substitute the paragraph beginning at page 24, line 15 and ending at page 24, line 24 to read as follows:

-- In a lower portion of the casing member 22, a transmitter 111 and a receiver 112 are attached to the through water pipe line 10 as in the cabinet 30 of the detection section 100 according to the first embodiment. When the transmitter 111 and the receiver 112 are attached to the through water pipe line 10, they are housed in a lower portion of the circuit/sensor housing area AS by the press member 32. The press member 32 is ~~made up~~

~~of~~ provided with a pair of press parts 32a and 32b and a flat part 32c. The pair of press parts 32a and 32b is formed at both ends of the flat part 32c so as to be opposed to each other. --

Please substitute the paragraph beginning at page 31, line 1 and ending at page 31, line 14 to read as follows:

-- ~~A transmitter transmits an ultrasonic wave. A receiver receives the ultrasonic wave from the transmitter. An output signal of the receiver is amplified. A phase comparator outputs a voltage corresponding to the phase difference based on a high frequency signal generated by a high frequency signal oscillator and an output signal of a high frequency signal amplifier. A low frequency amplifier amplifies the output voltage of the phase comparator. A comparator compares the output signal of the low frequency amplifier with a reference voltage and outputs a pulse indicating the comparison result. A frequency divider divides the output pulse. A decoder decodes the output signal of the frequency divider for turning on light emission sections of a flow indicator in green in order~~ A flow sensor comprises a detection section and a main unit section. The detection section comprises a casing, a through water pipe line, a transmitter

which transmits an ultrasonic wave, a receiver which receives the ultrasonic wave from the transmitter, and a flow indicator having light emission sections. The main unit section comprises a display section for displaying the flow quantity value. The casing and the through water pipe line have a width perpendicular to the longitudinal direction of the through water pipe line, and the width of the casing is approximately equal to the width of the through water pipe line. One of the faces of the casing consists of the light emitting sections and a planar face whereby the width of the casing can be minimized. The detection section further comprises an alarm detector and a compute unit performs different processing when the alarm signal is on. --